

# *Project Baseline Summary Report*

Data Source: **EM CDB**

Operations/Field Office: **Ohio**

Site Summary Level: **Fernald Environmental Management Project**

Project **OH-FN-06 / Soils**

Report Number: **GEN-01b**

Print Date: **3/9/2000**

HQ ID: **0530**

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## **General Project Information**

### **Project Description Narratives**

#### **Purpose, Scope, and Technical Approach:**

Definition of Scope: The Soils project consists of work scope from various operable units and specifically includes the excavation of soils within the OU1 boundaries (Area 6), not including the Waste Pits contents; planning, design, excavation, characterization, Title III, and maintenance of the OU2 Waste Units (Active and Inactive Flyash Piles, Southfield, Solid Waste Landfill, and Lime Sludge Ponds); and maintenance of the OU2 Removal Actions at the Southern Waste Units and excavation of impacted material to be placed in the OSDF. Activities related to OU5 include planning, design, excavation, characterization, Title III, and maintenance of soils remediation areas 1, 2-II, 3, 4, and 5; planning, design, characterization, Title III, and maintenance of soils remediation areas; Maintenance of RA-17 Soils Stockpiles; regulatory documentation for soils remediation, including initiation of the final risk assessment; excavation of impacted material to be placed in the OSDF; and transport of Non-WAC soils from the OU5 soils remediation areas to an off-site disposal facility.

NOTE: Workscope for all excavation includes transport to the OSDF, but not placement and compaction. It also includes final grade and seeding.

Technical Approach: Final cleanup for the FEMP includes excavation of contaminated soils and placement in the OSDF. The amount and location of soils to be excavated have been established in the OU5 ROD and implementation of the recommendations from the CTF for cleanup levels. Verification and confirmation that the remaining soils are below action level is also included in the scope of this project.

Emerging Technologies: Rtrack (mobile detection unit). High Purity Germanium detectors to locate and remove soil. Global positioning. Real-time certification techniques for radionuclides and metals in soils.

Technology Needs: The following prioritized needs should be addressed: OH-F004 identifies the need for a device to quickly and reliably detect the presence of Tc-99 in suspected soil samples. The instrumentation would permit the continuous processing of soil, as opposed to batch processing. OH-F009 identifies the need for uranium, thorium, and radium detection in soil and other solid waste streams. This need is being addressed by the various technologies that will be made available under an ASTD funded effort at the FEMP. The need for "Non-Intrusive Location of Buried Items" (OH-F003) could provide assistance to soil excavation if a cost effective technology could be developed. The need for improvements to the real-time uranium detection has been identified as OH-F037. This would address such items as monitoring in high-moisture content soil, considerable terrain variation, and high background areas. FEMP has also identified the need for a "Decrease in the Quantity of Uranium Contaminated Soil for OH Site Disposition" (OH-F036). FEMP is investigating the potential use of the segmented gate system to address this need.

#### **Project Status in FY 2006:**

All area excavations (except for Area 7) are completed and dispositioned in the On Site Disposal Facility.

#### **Post-2006 Project Scope:**

Scope includes natural resource restorations (final grading) and predesign and design activities for Area 7 (Silos and AWWT areas) excavation. The actual excavation, currently planned in PBS-13, will take place after FY2008.

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## **Project Description Narratives**

### **Project End State**

Access to the OSDF will remain restricted and monitored and under institutional controls in perpetuity. The remainder of the site is expected to achieve final cleanup levels which could support various land uses. However, the decision to limit use to ecological restoration and recreational use was made based on DOE's Natural Resource Damages Act obligations and stakeholder input. Residential and agricultural uses will not be considered for any portion of the site consistent with the recommendations of the Fernald Citizens Advisory Board. Industrial uses may be considered for the 23 acres of potential economic development land. DOE, or a successor agency, will maintain stewardship responsibility for the site.

### **Cost Baseline Comments:**

Assumptions are that the present level of RCRA, CERCLA, and NEPA integration will be maintained or improved; potential incremental funding of construction contracts; incremental funding for soils excavation; maintain existing schedule duration for soils activities; and no contingency. Estimates to support the baseline for this PBS were completed using a bottoms-up approach.

The Ohio Field Office has an aggressive cost savings program in place to contain or reduce the Total Estimated Cost of the project; however, there is potential for cost growth at the Fernald Environmental Management Project (FEMP) because the baseline estimates do not include contingency, and Operable Unit 4 (Silos Project) is in the process of amending the Record of Decision with the EPAs.

### **Safety & Health Hazards:**

The hazards of this project include radiological hazards due to penetrating radiation as well as the potential for internal dose from radionuclide uptake. Physical hazards include injury from heavy equipment operations and hoisting and rigging. In addition, workers can be expected to encounter normal occupational hazards such as lifting, tripping, or falling. Weather extremes expose personnel to heat and cold stress conditions.

### **Safety & Health Work Performance:**

The resources necessary to plan and provide oversight in order to accomplish the planned work safely are provided through the project's allocation of assigned safety and health functional area subject matter experts. Safety and Health resources representing functional areas such as radiological safety, occupational safety and health, fire protection engineering and emergency management are planned and allocated into the projects by cost centers through the work break down structure. Safety and health funding for this project is expected to increase as the excavation of soils begins and then remain constant until final closure is accomplished. There are no unfunded Safety and Health categories.

### **PBS Comments:**

The excavation and availability of soils is a critical element for placement of the waste in the OSDF.

The FEMP project has already undergone strategic planning to accelerate the cleanup from 25 years to 10 years. This has resulted in a significant amount of savings. To further reduce mortgage costs and allocate additional funds to the cleanup activities requires: a) the removal of the nuclear materials from the site; b) completion of safe shutdown activities; c) utility reduction projects, and (d) innovative technology particularly for real-time analysis, certification of cleanup/release levels. A factor that allowed the FEMP to pursue accelerated cleanup is the agreement and recommendations made by the Citizens Task Force on cleanup levels and disposition of the waste (amount and waste acceptance criteria levels for onsite disposal facility and disposition off-site for wastes above the waste acceptance criteria). Major efforts at recycling materials from the site have been initiated to help

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## Project Description Narratives

reduce/minimize the size of the disposal cell.

Fernald developed and implemented an accelerated schedule in FY 1995. This baseline was validated and granted Level 1 approval on August 21, 1996. Impacts to the baseline due to the current funding targets will cause a three year schedule extension. Fernald has committed to implementing cost savings, productivity improvements, and incremental funding to complete the project within the FY 2006 timeframe.

### Baseline Validation Narrative:

On October 29, 1998, DOE-FEMP received DOE-HQ approval on the Fiscal Year 1999 Replan Baseline Change Proposal to the current FEMP Baseline. The FEMP Baseline had been previously validated after DOE-HQ completed their review and provided their approval on August 21, 1996. Many internal and external reviews have been performed on the FEMP Baseline. In March 1998, the U.S. Corps of Engineers performed an external cost review on the OSDF project with results showing the disposal cell estimates consistent with industry standards. In August 1997 and January 1996, external cost reviews were performed on Operable Unit 4, one by the U.S. Corps of Engineers and one by the U.S. Department of Interior (DOI) and the U.S. Department of Energy (DOE). In June 1996, LMI, Janson Associates, and Burns & Roe performed an external cost review on support costs showing the cost estimates were reasonable. In July 1995, DOI and DOE performed an external cost review on Operable Unit 1 and made formal recommendations to generate technical and/or economic advantages. In September 1993, MTC, Booz-Allen, and Burns & Roe performed an external cost review on the FEMP site and had no significant findings. In addition to external cost reviews, since 1991 almost fifteen internal reviews have been performed.

## General PBS Information

**Project Validated?** Yes **Date Validated:** 10/29/1998

**Has Headquarters reviewed and approved project?** Yes

**Date Project was Added:** 12/1/1997

**Baseline Submission Date:** 7/8/1999

**FEDPLAN Project?** Yes

Drivers:	CERCLA	RCRA	DNFSB	AEA	UMTRCA	State	DOE Orders	Other
	Y	Y	N	N	N	N	N	Y

## Project Identification Information

**DOE Project Manager:** Rob Janke

**DOE Project Manager Phone Number:** 513-648-3124

**DOE Project Manager Fax Number:** 513-648-3076

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## General PBS Information

DOE Project Manager e-mail address: rob.janke@fernald.gov

Is this a High Visibility Project (Y/N):

## Planning Section

### Baseline Costs (in thousands of dollars)

	1997-2006 Total	2007-2070 Total	1997-2070 Total	1997	Actual 1997	1998	Actual 1998	1999	2000	2001	2002	2003	2004	2005	2006	
PBS Baseline (current year dollars)	202,686	14,834	217,520	12,754	10,450	12,688	16,155	19,917	18,206	16,549	21,036	24,166	43,827	19,047	14,496	
PBS Baseline (constant 1999 dollars)	186,543	11,801	198,344	12,754	10,450	12,688	16,155	19,917	17,727	15,690	19,420	21,723	38,361	16,233	12,030	
PBS EM Baseline (current year dollars)	202,686	14,834	217,520	12,754	10,450	12,688	16,155	19,917	18,206	16,549	21,036	24,166	43,827	19,047	14,496	
PBS EM Baseline (constant 1999 dollars)	186,543	11,801	198,344	12,754	10,450	12,688	16,155	19,917	17,727	15,690	19,420	21,723	38,361	16,233	12,030	
	2007	2008	2009	2010	2011- 2015	2016- 2020	2021- 2025	2026- 2030	2031- 2035	2036- 2040	2041- 2045	2046- 2050	2051- 2055	2056- 2060	2061- 2065	2066- 2070
PBS Baseline (current year dollars)	6,089	8,745	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PBS Baseline (constant 1999 dollars)	4,920	6,881	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PBS EM Baseline (current year dollars)	6,089	8,745	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PBS EM Baseline (constant 1999 dollars)	4,920	6,881	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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## Baseline Escalation Rates

1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0.00%	0.00%	0.00%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.10%
2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%

## Project Reconciliation

### Project Completion Date Changes:

Previously Projected End Date of Project: 4/1/2006

Current Projected End Date of Project: 9/30/2008

#### Explanation of Project Completion Date Difference (if applicable):

Previous baselines defined the Soils Project end date by the completion of soils excavation that will be placed in the On Site Disposal Facility by FY2006. Current baseline now includes scope for predesign and design activities for Area 7 (Silos and AWWT areas) excavation. This excavation, currently planned in PBS-13, will take place after FY2008.

## Project Cost Estimates (in thousands of dollars)

Previously Estimated Lifecycle Cost (1997 - 2070, 1998 Dollars):	182,021	Actual 1997 Cost:	10,450	Actual 1998 Cost:	16,155
Previously Estimated Lifecycle Cost of Project (1999 - 2070, 1998 Dollars):	155,416	Inflation Adjustment (2.7% to convert 1998 to 1999 dollars):			4,196
Previously Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):	159,612				

## Project Cost Changes

### Cost Adjustments Reconciliation Narratives

Cost Change Due to Scope Deletions (-):

Cost Reductions Due to Efficiencies (-):

Cost Associated with New Scope (+): 12,449 \$12,449K due to storage & shipping of excavated RCRA soils in production area.

Cost Growth Associated with Scope Previously Reported (+):

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## Project Reconciliation

**Cost Reductions Due to Science & Technology Efficiencies (-):**

**Subtotal:** 172,061

**Additional Amount to Reconcile (+):** 841 \$1,131K due to FY97/FY98 Uncosted Balances. (\$290K) due to FY97 Actuals escalation error in IDMS.

**Current Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):** 172,902

## Milestones

Milestone/Activity	Field Milestone Code	Original Date	Baseline Date	Legal Date	Forecast Date	Actual Date	EA	DNFSB	Mgmt. Commit.	Key Decision	Intersite
Submit Pre-final Integrated Remedial Design Package for Area 3A/4A to EPAs.	5CCSD1M030		3/31/2000	3/31/2000	3/31/2000		Y				
Submit Prefinal Design To EPA Area 4/5.	5CCSDX4M01		11/15/2000		11/15/2000						
Submit Prefinal Design To EPA for Areas 6, 7, 1-III, 2-II.	5CCSDX6M01		1/15/2001		1/15/2001						
Submit Draft Final To USEPA for Area 3 RAWP/Design Package (CA).	5CCRA5M002		3/31/2000		3/31/2000						
Submit Integrated Remedial Design Package for Area 3B/Area 4B to EPAs.			4/1/2002	4/1/2002			Y				
Begin remediation of soils.			10/1/1992								
Submit Area 9, Phase I Certification Design Letter to EPAs.			8/29/1999	8/29/1999			Y				
Submit Area 1, Phase III Certification Design Letter to EPAs.			3/31/2000	3/31/2000			Y				
Submit Area 9, Phase II Certification Design Letter to the EPAs.			8/27/2000	8/27/2000			Y				
Submit Area 2, Phase II Integrated Remedial Design package to EPAs.			12/31/2001	12/31/2001			Y				
Submit Area 8, Phase III Certification Design Letter to EPAs.			6/30/2003	6/30/2003			Y				
Submit Area 6 Integrated Remedial Design Package to			12/1/2003	12/1/2003			Y				

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Milestone/Activity	Field Milestone Code	Original Date	Baseline Date	Legal Date	Forecast Date	Actual Date	EA	DNFSB	Mgmt. Commit.	Key Decision	Intersite
EPAs.											
Submit Area 10 Integrated Remedial Design Package to EPAs.			3/30/2007	3/30/2007			Y				
Submit Area 7 Integrated Remedial Design Package to EPAs.			3/31/2008	3/31/2008			Y				
Submit Area 5 Integrated Remedial Design Package to EPAs.			7/1/2002	7/1/2002			Y				
Complete soils excavation and remediation.			9/30/2008								

## Milestones - Part II

Milestone/Activity	Field Milestone Code	Critical Decision	Critical Closure Path	Project Start	Project End	Mission Complete	Tech Risk	Work Scope Risk	Intersite Risk	Cancelled	Milestone Description
Submit Pre-final Integrated Remedial Design Package for Area 3A/4A to EPAs.	5CCSD1M030										
Submit Prefinal DesignTo EPA Area 4/5.	5CCSDX4M01									Y	
Submit Prefinal Design To EPA for Areas 6, 7, 1-III, 2-II.	5CCSDX6M01									Y	
Submit Draft Final To USEPA for Area 3 RAWP/Design Package (CA).	5CCRA5M002									Y	
Submit Integrated Remedial Design Package for Area 3B/Area 4B to EPAs.											Submit IRDP to EPA for Area 3B/4B per Table 1-5 FEMP SEP Final schedule of Remedial Design Deliverables.
Begin remediation of soils.				Y							
Submit Area 9, Phase I Certification Design Letter to											Per Table 1-5 of the FEMP SEP Final, schedule of Remedial Design

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## Milestones - Part II

Milestone/Activity	Field Milestone Code	Critical Decision	Critical Closure Path	Project Start	Project End	Mission Complete	Tech Risk	Work Scope Risk	Intersite Risk	Cancelled	Milestone Description
EPAs.											deliverables.
Submit Area 1, Phase III Certification Design Letter to EPAs.											Per Table 1-5, FEMP SEP Final schedule of Remedial Design deliverables.
Submit Area 9, Phase II Certification Design Letter to the EPAs.											Per Table 1-5 FEMP SEP Final schedule of Remedial Design Deliverables.
Submit Area 2, Phase II Integrated Remedial Design package to EPAs.											
Submit Area 8, Phase III Certification Design Letter to EPAs.											Per Table 1-5 FEMP SEP Final Schedule of Remedial Design deliverables.
Submit Area 6 Integrated Remedial Design Package to EPAs.											Per Table 1-5 FEMP SEP Final schedule of Remedial Design deliverables.
Submit Area 10 Integrated Remedial Design Package to EPAs.											Per Table 1-5 FEMP SEP Final schedule of Remedial Design deliverables.
Submit Area 7 Integrated Remedial Design Package to EPAs.											Per Table 1-5 FEMP SEP final schedule of Remedial Design deliverables.
Submit Area 5 Integrated Remedial Design Package to EPAs.											Per Table 1-5 FEMP SEP Final schedule of Remedial Design deliverables.
Complete soils excavation and remediation.					Y	Y					

## Performance Measure Metrics

Category/Subcategory	Units	1997-2006 Total	2007-2070 Total	1997-2070 Total	Actual Pre-1997	Planned 1997	Actual 1997	Planned 1998	Planned 1999	Planned 2000	Planned 2001	Planned 2002	Planned 2003	Planned 2004
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RS														
Assess.	NR	0.00	0.00	0.00	1.00									
RS														
Cleanup	NR	1.00	0.00	1.00										
LLW														
Ship to DOE Disp.	M3	230.00	0.00	230.00	0.00		0.00	0.00	0.00	0.00	0.00	230.00	0.00	0.00
Rem. Waste														
Disposed	M3	20,624.00	6,685.00	27,309.00	0.00		0.00	0.00	967.00	861.00	3,083.00	858.00	278.00	5,165.00
Category/Subcategory	Units	Planned 2004	Planned 2005	Planned 2006	Planned 2007	Planned 2008	Planned 2009	Planned 2010	Planned 2011 - 2015	Planned 2016 - 2020	Planned 2021 - 2025	Planned 2026 - 2030	Planned 2031 - 2035	
RS														
Assess.	NR													
RS														
Cleanup	NR	1.00												
LLW														
Ship to DOE Disp.	M3	0.00												
Rem. Waste														
Disposed	M3	5,165.00	5,869.00	3,543.00	3,786.00	2,899.00								
Category/Subcategory	Units	Planned 2036 - 2040	Planned 2041 - 2045	Planned 2046 - 2050	Planned 2051 - 2055	Planned 2056 - 2060	Planned 2061 - 2035	Planned 2066 - 2070	Exceptions	Lifecycle Total				
RS														
Assess.	NR									1.00				
RS														
Cleanup	NR									1.00				

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Category/Subcategory	Units	Planned 2036 - 2040	Planned 2041 - 2045	Planned 2046 - 2050	Planned 2051 - 2055	Planned 2056 - 2060	Planned 2061 - 2035	Planned 2066 - 2070	Exceptions	Lifecycle Total
LLW										
Ship to DOE Disp.	M3									230.00
Rem. Waste										
Disposed	M3									26,445.00

## Release Sites

Site Code	RSF ID	Change Flag	Description	Class/Subclass Name	Planned Assess. Year	Forecast Assess. Year	Actual Assess. Date	Planned Comp. Year	Forecast Comp. Year	Actual Comp. Date	Acc. Year	No Action	Comp. Status	RAD
FEMP	0217		OU2 \ Other Waste Units	Above Ground Material / Waste/Debris Piles	1995	2001	6/8/1995	2005	2005		2005	N		N

## Technology Needs

Site Need Code: OH-F004

Site Need Name: Technitium-99 Detector/Analyzer

Focus Area Work Package ID: SS-01

Focus Area: SCFA

Benefits (Cost, Risk Reduction, Both): Cost

Focus Area Work Package: Characterization, Monitoring, Modeling and Analysis

Agree with Technology Link: Y

### Technologies

### Cost Savings (in thousands of dollars)

### Range of Estimate

### Related CCP Milestones

### Related Waste Streams

### Agree?

### Change?

00063: LLW-3.1 - LLW Contaminated Soil

Y

N

00062: LLW-2 - LLW Contaminated Soil

Y

N

00061: LLW-1 - LLW Contaminated Soil

Y

N

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## Technology Needs

Site Need Code: OH-F009

Site Need Name: Real Time or In-situ soil and waste stream analyzer for FRL or WAC compliance

Focus Area Work Package ID: SS-01

Focus Area Work Package: Characterization, Monitoring, Modeling and Analysis

Focus Area: SCFA

Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both): Cost

### Technologies

Delineating Contamination in Soils

### Cost Savings (in thousands of dollars)

45,000

### Range of Estimate

Medium

### Related CCP Milestones

### Related Waste Streams

### Agree?

### Change?

00063: LLW-3.1 - LLW Contaminated Soil

Y

N

00062: LLW-2 - LLW Contaminated Soil

Y

N

00061: LLW-1 - LLW Contaminated Soil

Y

N

Site Need Code: OH-F036

Site Need Name: Decrease in Quantity of Uranium Contaminated Soil for Off-site Disposition

Focus Area Work Package ID: SS-10

Focus Area Work Package: Hot Spot Removal

Focus Area: SCFA

Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both): Cost

### Technologies

Segmented Gate System

### Cost Savings (in thousands of dollars)

30,000

### Range of Estimate

Medium

### Related CCP Milestones

### Related Waste Streams

### Agree?

### Change?

00063: LLW-3.1 - LLW Contaminated Soil

Y

N

00061: LLW-1 - LLW Contaminated Soil

Y

N

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## Technology Needs

**Site Need Code:** OH-F037

**Site Need Name:** Improved In Situ Determination of Uranium & Other Gamma Emitting Radionuclides in Soil

**Focus Area Work Package ID:** SS-01

**Focus Area Work Package:** Characterization, Monitoring, Modeling and Analysis

**Focus Area:** SCFA

**Agree with Technology Link:** Y

**Benefits (Cost, Risk Reduction, Both):** Cost

### Technologies

Delineating Contamination in Soils

**Cost Savings (in thousands of dollars)**

**Range of Estimate**

0

### Related CCP Milestones

#### Related Waste Streams

**Agree?**

**Change?**

00063: LLW-3.1 - LLW Contaminated Soil

Y

N

00062: LLW-2 - LLW Contaminated Soil

Y

N

00061: LLW-1 - LLW Contaminated Soil

Y

N

**Site Need Code:** OH-F003

**Site Need Name:** Non-Intrusive Location of Buried Items

**Focus Area Work Package ID:** SS-01

**Focus Area Work Package:** Characterization, Monitoring, Modeling and Analysis

**Focus Area:** SCFA

**Agree with Technology Link:** Y

**Benefits (Cost, Risk Reduction, Both):** Both

### Technologies

Electrical Resistance Tomography for Subsurface Imaging

Three Dimensional Three-Component Seismic Imaging for Site Characterization

Inverse Scattering Ground Penetrating Radar Imaging of Buried Objects

0

Inverse Scattering Ground Penetrating Radar Imaging of Buried Objects

High Resolution Imaging Using Holographic Impulse Radar Array

High Resolution Imaging Using Holographic Impulse Radar Array

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## **Technology Needs**

Imaging Infrared Interferometer

Crosshole Compressional and Shear Wave Seismic Tomography

### **Related CCP Milestones**

### **Related Waste Streams**

### **Agree?**

### **Change?**

00067: LLW-7 - LLW Debris

Y

N

00063: LLW-3.1 - LLW Contaminated Soil

Y

N

00062: LLW-2 - LLW Contaminated Soil

Y

N

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Dataset Name: **FY 1999 Planning Data**

Date of Dataset: **9/20/1999**

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